dislodge it has seemed unwise. Even the International Permanent Committee on Meteorology has found nothing better for general use, although instruments may be at hand that will give the velocity in miles per hour at any spot where an anemometer happens to be established. The officials of all Government weather bureaus have suggested their various substitutes for the Beaufort scale, and numerous alterations have thus been made in the terms and definitions recommended to public use, but the Beaufort wind scale has not yet been given up.

The introduction of such alterations in the definitions of ordinary well-known English words has led to great confusion of records and usages. Our own daily weather charts are widely known over the world and local terms should be avoided. It is better to adhere to the terms and corresponding velocities of the well-known Beaufort scale when one has no freely exposed velocimeter or anemometer. There has been great improvement in anemometers, but that does not justify us in departing from the Beaufort scale for the use of the millions who have no such apparatus.

There have been many efforts to establish a scale of *ten* terms from calm to hurricane, as recommended by the International Meteorological Committee in 1873 and 1874; various scales have been suggested of nine, eight, seven, six, and four terms, respectively, and there have been numerous attempts to reduce each of these to the simple fundamental Beaufort scale of twelve terms, but the latter is still used. Nine fundamental terms of that original scale, i. e., calm, light, fresh, breeze, brisk, high, gale, storm, hurricane, and their additional modifications by the words gentle, moderate, strong, have proved to be sufficient for ordinary use, both at sea and on land. These terms are in ordinary use by English-speaking observers, as well as many other nations, all over the world; they are well defined in any modern dictionary, thereby forbidding any educated person from complaining that the terms are not understood. Those newspapers and correspondents who wish these terms translated into miles per hour should consult the ordinary popular works on meteorology. In general, it is sufficient to know that a moderate gale means a wind having a velocity of 35 to 45 miles per hour, from which we may count upward or downward, without any expensive apparatus.

The adoption of the Beaufort scale in 1905 by the instructions of the former chief of the Weather Bureau, as also its continued usage by the orders of the present chief in 1914, assure us that there is good reason for its general use. If one has no anemometer and wishes to use a 10-scale, he may group the latter part of the Beaufort and call that the end or No. 10 of his own scale.

---

We note that lately the British Meteorological Office has adopted as definitions of the respective terms of the Beaufort scale the approximate equivalent values in meters per second. These are here given for the information of the reader; and the comparison between all these shows that while retaining the terms of the Beaufort scale, there have also been great differences between those who have attempted to convert it into observed velocity or pressure.

Adopted velocities.

| Beaufort wind scale. | | Meters per second. | Miles per hour. | |
|---|---|---|---|---|
| No. | Terms. | Hann. | Milham. | Weather Bureau, Feb., 1914. |
| 0 | Calm | Calm. | 0 | 0 to 3 |
| 1 | Light air | 1.7 | 3 | 3 to 8 |
| 2 | Light breeze | 3.1 | 13 | 8 to 13 |
| 3 | Gentle breeze | 4.8 | 18 | 13 to 18 |
| 4 | Moderate breeze | 6.7 | 23 | 18 to 23 |
| 5 | Fresh breeze | 8.8 | 28 | 23 to 28 |
| 6 | Strong breeze | 10.7 | 34 | 28 to 34 |
| 7 | Moderate gale | 12.9 | 40 | 34 to 40 |
| 8 | Fresh gale | 15.4 | 48 | 40 to 48 |
| 9 | Strong gale | 18.0 | 56 | 48 to 56 |
| 10 | Whole gale | 21.0 | 65 | 56 to 65 |
| 11 | Storm | 30 | 75 | 65 to 75 |
| 12 | Hurricane | 50 | 90 | 75 or over. |

As used by British Meteorological Office.

| Beaufort No. | Miles per hour. | Meters per second. | Feet per second. | Pressures.[1] | |
|---|---|---|---|---|---|
| | | | | Pounds per square foot. | Millibars. |
| 0 | Less than 1 | Less than 0.3 | Less than 2 | 0.00 | 0.00 |
| 1 | 1- 3 | 0.3- 1.5 | 2- 5 | 0.01 | 0.01 |
| 2 | 4- 7 | 1.6- 3.3 | 6- 11 | 0.08 | 0.04 |
| 3 | 8-12 | 3.4- 5.4 | 12- 18 | 0.28 | 0.13 |
| 4 | 13-18 | 5.5- 8.0 | 19- 27 | 0.67 | 0.32 |
| 5 | 19-24 | 8.1-10.7 | 28- 36 | 1.31 | 0.62 |
| 6 | 25-31 | 10.8-13.8 | 37- 46 | 2.3 | 1.1 |
| 7 | 32-38 | 13.9-17.1 | 47- 56 | 3.6 | 1.7 |
| 8 | 39-46 | 17.2-20.7 | 57- 68 | 5.4 | 2.6 |
| 9 | 47-54 | 20.8-24.4 | 69- 80 | 7.7 | 3.7 |
| 10 | 55-63 | 24.5-28.4 | 81- 93 | 10.5 | 5.0 |
| 11 | 64-75 | 28.5-33.5 | 94-110 | 14.0 | 6.7 |
| 12 | Above 75 | 33.6 or above. | Above 110 | 17.0 or over. | 8.1 or over. |

[1] These figures are computed for air of standard density; they diminish as we ascend in the atmosphere, they increase with the momentum of any rain that is driven with the wind.—[C. A.]

## ICE PATROL OVER THE NORTH ATLANTIC OCEAN.

By EDWARD H. BOWIE, District Forecaster.

[Dated United States Weather Bureau, Washington, May 13, 1914.]

Commissioners appointed by the several nations to make recommendations concerning "The safety of life at sea" held meetings at London, England, during the period November 12, 1913, to January 20, 1914, and, besides adopting regulations concerning the equipment of vessels, etc., proposed a patrol of the North Atlantic Ocean in the region of the steamer routes for the observation and study of ice conditions and for the destruction of derelicts. Each nation that was a party to the commission agreed to bear its proportionate part of the expenses of the patrol and the United States was invited to inaugurate and maintain such a service in 1914 in the following language:

The Government of the United States is invitad to undertake the three services of derelict destruction, study and observation of ice conditions, and ice patrol, etc.

During the spring and early summer of 1913, previously to the meeting of the commission, work of this character was conducted by the S. S. *Scotia*. During the present year, however, the work is being conducted by the revenue

cutter *Seneca*, in accordance with the recommendations of the commission. Besides being equipped for a study of ice conditions and securing data regarding the direction, speed, and temperature of the ocean currents, the *Seneca* has also a meteorological outfit, and observations will be be taken several times daily of the barometer, temperature, wind direction, state of the weather, and force of the wind. The 4 a. m. observation is embodied with other information in a radiogram sent each day to New York, and the meteorological observation is thence transmitted to Washington for use on the Northern Hemisphere Weather Chart. The first message of this character was received April 9. The reports from the *Seneca* are usually received in time to be published in the table on the Northern Hemisphere Weather Map.

The work done by the S. S. *Scotia* in 1913 is of great interest to meteorologists. Among the observations taken are the following:

(1) The taking of water samples by means of the full-speed water bottle when the ship is moving and by means of the insulating or reversing bottle at various depths when the ship is stationary. The samples are used in obtaining the salinity of the water and also in connection with the plankton investigations, about which something will be said later. The value of the water samples depends not only on the differences in salinity which show the boundaries between the various currents, but also on the differences in density when temperature is taken into consideration, as from these latter it is possible to calculate dynamically the differences of current flow.

(2) The ordinary surface net and the full-speed tow net were used in obtaining samples of plankton at the surface and at depths down to 30 fathoms or more for use in studying the distribution of these minute forms of plant life in connection with the temperature and salinity. In the report of the work done by the S. S. *Scotia* during 1913 reference was made to certain samples which showed strongly marked horizontal and vertical thermal and biologic boundary lines. These boundaries seem to limit bodies of water apparently of polar and southern origin respectively. An examination of the plankton contained in the water frequently enables one to identify the source of the strata of water forming the different currents by reason of the fact that the distribution of the definite species is largely determined by the different degrees of salinity and temperature.

(3) Ocean currents at various depths and ice-drift measurements were made.

(4) Water temperatures were measured by the ordinary water thermometers at different depths and the Callendar-Barnes self-recording thermometer was also used. No rise in temperature was noted on approaching icebergs.

(5) Air temperatures were observed with standard thermometers and recorded on a thermograph. In this connection 13 successful kite flights were made, although with difficulty, it being found difficult to get the kites away from the ship with success owing to the wind eddies caused by the spars and rigging of the ship. On one occasion, in the midst of a fog, a captive balloon was sent up to an altitude of 3,500 feet, records of temperature and humidity being obtained. On 8 flights made during foggy weather an inversion of temperature was in each case noted. But fog did not prevail with all inversions of temperature. However, all marked inversions were recorded during fogs, but slight inversions occurred without fog. Comparative wind velocities at 45 and 70 foot levels showed that velocities at the 70-foot level were greater by about 7 per cent than those at the 45-foot level. Hygrometric observations were made with the hair hygrometer and the wet and dry bulb thermometers. The height and direction of seas and swells and the density of fog were also noted.

Similar atmospheric observations and studies will be made during the season of 1914, and it is hoped that by studying the ocean currents their relation to the extent and time of the southward drift of the icebergs may be determined.

## A LAKE HURON CURRENT.

In a letter [dated May 4, 1914] from Mr. John D. Persons, relative to the stranding of the steamer *Acadian* he says:

> You ask me some questions in regard to the stranding of the steamer *Acadian* on Sulphur Island, November 9–11, 1913. "Was it due to the influence of some unknown strong current? Are not the local currents in Lake Huron during strong winds well known?"
>
> When I was a young man I was in the fishing business; it was there that I first learned that a strong current at times sets down the west shore of Lake Huron, into Saginaw Bay. After I came into the Life-Saving Service, being located on the turning point of Lake Huron, Thunder Bay Island, I soon began to notice that shipping was affected by this current. Steamers coming up the lake, crossing from Point Aux Barques to this Island in smoky and thick weather, would all fetch up from 1 to 3 miles behind this island, from 6 to 10 miles off their regular compass course. Not one boat, but all boats during that day would be affected by that current. Fishermen suffer a great deal by this current, as it sweeps their buoys under so they can not find their nets. The writer has seen the ice fields going down the lake much faster than a man could walk, and not a breath of wind.
>
> During my 36 years as keeper of this station I attribute many strandings that have occurred in this vicinity in thick weather to this unknown current. A steamer crossing from Point Aux Barques to Thunder Bay Island, a distance of 75 miles, with a strong current striking her on the starboard side must move sideways to some extent.
>
> You ask me if this current is not well known. No, only to the fishermen and tug men that have been rafting and towing saw logs. So far as I am informed this current is not strong enough to be observed, only on certain occasions. As far as my observation goes, the wind has nothing to do with it at certain times, runs very strong at times with no wind. A question. If the water fell 2 or 3 feet along the west shore of Thunder Bay November 9, and rose 3 or 5 feet at Port Huron what would be the result? Would not that water set into Saginaw Bay strong enough to carry the *Acadian* sideways off her course several miles? Her cargo did not shift nor were there any irregularities of her compass.
>
> Mr. Frank Jermin and myself are making quite a study of this matter and we are in hopes to have something to place before the Weather Bureau office at no distant day.

## PROPOSED ASIATIC EXTENSION OF THE RUSSIAN WEATHER SERVICE.

John F. Jewell, United States consul at Vladivostok, advises us through the State Department, under date of April 17, 1914, as follows:

The Vladivostok Observatory has worked out and submitted to the Duma at St. Petersburg for approval a plan to organize a weather service in the Russian Far East. The plan proposes—

1. To establish 20 meteorological stations in the most important places, the construction to be completed within four years.

2. To establish special parallel stations at different altitudes, for the purpose of securing observations at differently exposed points under the same latitude; the construction to be completed within five years.

3. To make regular observations of the warm current called the Kuroshiwo, or the Japan Current.

4. To maintain a telegraphic branch at Vladivostok.

It is estimated that the total cost of installation and upkeep until completion will be 254,000 rubles ($130,810). As this meteorological system and its synoptical service develop the Vladivostok Observatory will undertake to notify the country population of approaching weather changes. It is intended to gradually enlarge the organization until it embraces the whole of the Russian Far East.